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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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FACTOR & LAKE, LTD 1327 W. WASHINGTON BLVD. SUITE 5G/H CHICAGO, IL 60607			LAVARIAS, ARNEL C	
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Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/657,756	Applicant(s) ALBERT ET AL.	
	Examiner Arnel C. Lavarias	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/12/04, 6/29/04, 9/8/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 20-22 is/are rejected.
- 7) ☒ Claim(s) 11-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 6/29/04, 9/8/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/12/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. It is noted that this application appears to claim subject matter disclosed in prior Application No. 60/409255, filed 9/9/02. A reference to the prior application must be inserted as the first sentence of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e) or 120. See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. Also, the current status of all nonprovisional parent applications referenced should be included.

If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C.

119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A priority claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed claim for priority under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Drawings

2. The drawings were received on 6/29/04 and 9/8/03. These drawings are acceptable.

Specification

3. The submission of a translation of the application into the English language along with a statement that the translation is accurate, both dated 6/29/04, is acknowledged and accepted. This submission complies with 37 CFR 1.52(d)(1).
4. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. *Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading.* If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

5. The disclosure is objected to because of the following informalities:

Section headings are missing.

It is general USPTO policy that specific references to claim numbers not be included within the specification of the disclosure, since claims will generally change, either in presence, content, or scope, during the prosecution of the application. Such changes may

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render the specification unclear or indefinite. Specific instances in the instant application include: Page 1, lines 7, 9; Page 3, lines 3, 7; Page 5, lines 24, 31; Page 8, lines 6, 8.

Page 10, line 2- 'diffractive' should read 'refractive'

Page 12, line 4- 'linearity' should read 'linearity'

Page 14, line 6- '7b' should read '7'

Page 18, line 7- 'Example 6:' should read 'Example 7:'

Page 18, line 20- 'Example 7:' should read 'Example 8:'

Page 19, line 1- 'Example 8:' should read 'Example 9:'

Page 19, line 14- 'Example 9:' should read 'Example 10:'.

Appropriate correction is required.

6. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claim 1, line 22 recites the limitation of '... selection ... of the compensation coatings...'. The specification of the disclosure does not specifically disclose the use of compensation coatings on one or more of the birefringent refractive elements to reduce the effects of intrinsic birefringence.

Claim Objections

7. Claims 11-19 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

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8. Claims 1-10, 20-22 are objected to because of the following informalities:

Regarding Claims 1, 4, and 20, the phrase "...in particular..." renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Claim 1 recites the limitation "the disturbing part of the intrinsic birefringence" in lines 24-25. There is insufficient antecedent basis for this limitation in the claim.

It is general USPTO policy that references to figures or drawings not be included within the claims, since the drawings and figures may change, either in presence, content, or scope, during the prosecution of the application. Such changes may render the claims unclear or indefinite. Specific instances in the instant application include: Claim 5, line 9; Claim 6, line 9; Claim 7, line 9; Claim 8, line 9; Claim 9, line 9; Claim 10, line 9.

Claim 20 provides for the use of a catadioptric part, a dioptric part, and a beam-deflecting arrangement in a method for compensating the intrinsic birefringence in a projection lens, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced (e.g. ...the disturbing influence of the intrinsic birefringence is reduced by... vs. ...reducing the disturbing influence of the intrinsic birefringence by...). Claims 21-22 are dependent on Claim 20, and hence inherit the deficiencies of Claim 20.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-2, 4/1, 4/2, 20-21, as best understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Hoffman et al. (U.S. Patent No. 6683710).

Hoffman et al. discloses a catadioptric projection lens (See Figure 34) for imaging in an image plane (See 231 in Figure 34) an object arranged in an object plane (See 230 in Figure 34), and a method for compensating the intrinsic birefringence in a projection lens, both the lens and method comprising a catadioptric part including a plurality of refractive optical elements through which the light rays pass through twice and an imaging mirror (See 244 in Figure 34); a dioptric part adjacent to the image plane which includes a plurality of exclusively refractive optical elements (See 246 in Figure 34); a beam-deflecting arrangement which guides the light rays issuing from an object point located in the object plane into the catadioptric part and a polarization-sensitive reflective layer (See 240, 208 in Figure 34); characterized in that at least some of the refractive optical elements in the catadioptric part and in the dioptric part adjacent to the image plane consist of a material which has intrinsic birefringence (See Abstract; col. 12, lines 38-57); through selection of the crystallographic orientation of the material and/or of the material, the disturbing part of the intrinsic birefringence is at least partially reduced (See

Abstract; col. 12, lines 38-57; col. 40, line 12-col. 51, line 34); and the catadioptric part and the dioptric part being compensated separately from one another with respect to intrinsic birefringence (See col. 40, line 12-col. 51, line 34). Hoffman et al. additionally discloses the catadioptric projection lens having a dioptric part adjacent to the object plane (See 242 in Figure 34); the birefringent refractive optical elements consisting of a fluoride (See Abstract; col. 12, lines 38-57); and the dioptric part adjacent to the object plane is compensated separately from the catadioptric part and from the dioptric part adjacent to the image plane with respect to intrinsic birefringence (See col. 44, line 7-col. 47, line 18).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 3, 4/3, 22, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman et al.

Hoffman et al. discloses the invention as set forth above in Claim 1, but does not specifically disclose the dioptric part adjacent to the object plane and the catadioptric part being compensated jointly, but separately from the dioptric part adjacent to the image plane with respect to intrinsic birefringence. However, Hoffman et al. does specifically teach that for such catadioptric projection lens systems, it would be useful to balance or

minimize the retardance produced by several different groups of optical elements.

Hoffman et al. additionally teaches performing such balancing or minimizing for each of the catadioptric part, the dioptric part adjacent the image plane, and the dioptric part adjacent the object plane as individual groups (See col. 44, line 7-col. 47, line 18) by choice of lens materials, orientation of crystal axes, and 'clocking' of the various lenses (See col. 23, line 33-col. 25, line 54). From these teachings, one of ordinary skill would have known to group particular sets of optical elements together to balance or minimize the effects of intrinsic birefringence for that particular set of optical elements. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the dioptric part adjacent to the object plane and the catadioptric part being compensated jointly, but separately from the dioptric part adjacent to the image plane with respect to intrinsic birefringence, as additionally taught by Hoffman et al., in the catadioptric projection lens, to achieve lower retardances over the group of optical elements, which may lead to overall reduction in the retardance of the optical system.

13. Claims 5-6, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman et al. in view of Shiraishi et al. (U.S. Patent Application Publication US 2003/0011893 A1).

Hoffman et al. discloses the invention as set forth above in Claims 1-4, except for the catadioptric part containing two lenses, the axes of which are disposed parallel to the (110) direction, the [1-10] direction of the first lens including an angle of 0 or 90 degrees, and the [1-10] direction of the second lens including an angle of 90 or 0 degrees, with a

reference direction which is disposed perpendicularly to the plane of projection of the Figure and is oriented toward the viewer. It is noted that such 'clocking' techniques for orienting particular crystalline axes of sets of fluoride-based optical elements, such as CaF_2 lenses, in deep ultraviolet applications, are well known in the art. For example, Shiraishi et al. teaches an exemplary optical system for use in deep ultraviolet (e.g. 157 nm) lithographic applications (See for example Figures 1-2, 8, 11), the system being catadioptric such that the catadioptric part has two lenses (See Figure 8), wherein the crystalline axes of pairs or groups of lenses (See in particular Figures 4-7, 9-10, 12), comprising a fluoride material such as CaF_2 , are oriented or 'clocked' at particular angles with respect to one another, depending on the optical axis orientation of the various lenses. Shiraishi et al. in particular teaches that if the optical axes of the lenses are parallel to the (110) direction, the [1-10] direction of the first lens should include an angle of 0 or 90 degrees, and the [1-10] direction of the second lens should include an angle of 90 or 0 degrees, such that the two lenses are rotated 90 degrees relative to each other (See Figures 10A-D; Paragraphs 0116-0122). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the catadioptric part contain two lenses, the axes of which are disposed parallel to the (110) direction, the [1-10] direction of the first lens including an angle of 0 or 90 degrees, and the [1-10] direction of the second lens including an angle of 90 or 0 degrees, with a reference direction which is disposed perpendicularly to the plane of projection of the Figure and is oriented toward the viewer, as taught by Shiraishi et al., in the lens of Hoffman et al., to

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minimize or reduce the effects of intrinsic birefringence present due to the use of CaF_2 in the deep ultraviolet.

14. Claims 7-8, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman et al. in view of Shiraishi et al.

Hoffman et al. discloses the invention as set forth above in Claims 1-4, except for the catadioptric part containing two lenses, the axes of which are disposed parallel to the (111) direction, the [1-10] direction of the first lens including an angle of 0 or 30 degrees, and the [1-10] direction of the second lens including an angle of 60 or 90 degrees, with a reference direction which is disposed perpendicularly to the plane of projection of the Figure and is oriented toward the viewer. It is noted that such 'clocking' techniques for orienting particular crystalline axes of sets of fluoride-based optical elements, such as CaF_2 lenses, in deep ultraviolet applications, are well known in the art. For example, Shiraishi et al. teaches an exemplary optical system for use in deep ultraviolet (e.g. 157 nm) lithographic applications (See for example Figures 1-2, 8, 11), the system being catadioptric such that the catadioptric part has two lenses (See Figure 8), wherein the crystalline axes of pairs or groups of lenses (See in particular Figures 4-7, 9-10, 12), comprising a fluoride material such as CaF_2 , are oriented or 'clocked' at particular angles with respect to one another, depending on the optical axis orientation of the various lenses. Shiraishi et al. in particular teaches that if the optical axes of the lenses are parallel to the (111) direction, the [1-10] direction of the first lens should include an angle of 0 or 30 degrees, and the [1-10] direction of the second lens should include an angle of 60 or 90 degrees, such that the two lenses are rotated 60 degrees relative to each other

(See Figures 5A-B; Paragraphs 0076-0080). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the catadioptric part contain two lenses, the axes of which are disposed parallel to the (111) direction, the [1-10] direction of the first lens including an angle of 0 or 30 degrees, and the [1-10] direction of the second lens including an angle of 60 or 90 degrees, with a reference direction which is disposed perpendicularly to the plane of projection of the Figure and is oriented toward the viewer, as taught by Shiraishi et al., in the lens of Hoffman et al., to minimize or reduce the effects of intrinsic birefringence present due to the use of CaF_2 in the deep ultraviolet.

15. Claims 9-10, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman et al. in view of Shiraishi et al.

Hoffman et al. discloses the invention as set forth above in Claims 1-4, except for the catadioptric part containing two lenses, the axes of which are disposed parallel to the (100) direction, the [010] direction of the first lens including an angle of 0 or 45 degrees, and the [010] direction of the second lens including an angle of 45 or 90 degrees, with a reference direction which is disposed perpendicularly to the plane of projection of the Figure and is oriented toward the viewer. It is noted that such 'clocking' techniques for orienting particular crystalline axes of sets of fluoride-based optical elements, such as CaF_2 lenses, in deep ultraviolet applications, are well known in the art. For example, Shiraishi et al. teaches an exemplary optical system for use in deep ultraviolet (e.g. 157 nm) lithographic applications (See for example Figures 1-2, 8, 11), the system being catadioptric such that the catadioptric part has two lenses (See Figure 8), wherein the

crystalline axes of pairs or groups of lenses (See in particular Figures 4-7, 9-10, 12), comprising a fluoride material such as CaF_2 , are oriented or 'clocked' at particular angles with respect to one another, depending on the optical axis orientation of the various lenses. Shiraishi et al. in particular teaches that if the optical axes of the lenses are parallel to the (100) direction, the [010] direction of the first lens should include an angle of 0 or 45 degrees, and the [010] direction of the second lens should include an angle of 45 or 90 degrees, such that the two lenses are rotated 45 degrees relative to each other (See Figures 6A-B; Paragraphs 0081-0087). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the catadioptric part contain two lenses, the axes of which are disposed parallel to the (100) direction, the [010] direction of the first lens including an angle of 0 or 45 degrees, and the [010] direction of the second lens including an angle of 45 or 90 degrees, with a reference direction which is disposed perpendicularly to the plane of projection of the Figure and is oriented toward the viewer, as taught by Shiraishi et al., in the lens of Hoffman et al., to minimize or reduce the effects of intrinsic birefringence present due to the use of CaF_2 in the deep ultraviolet.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias
Patent Examiner
Group Art Unit 2872
1/16/05